



• SCRAMBLING 'SHAM' Revealed



• BREAKING Records In Vegas



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COOP'S SATELLITE DIGEST



APRIL 15, 1985

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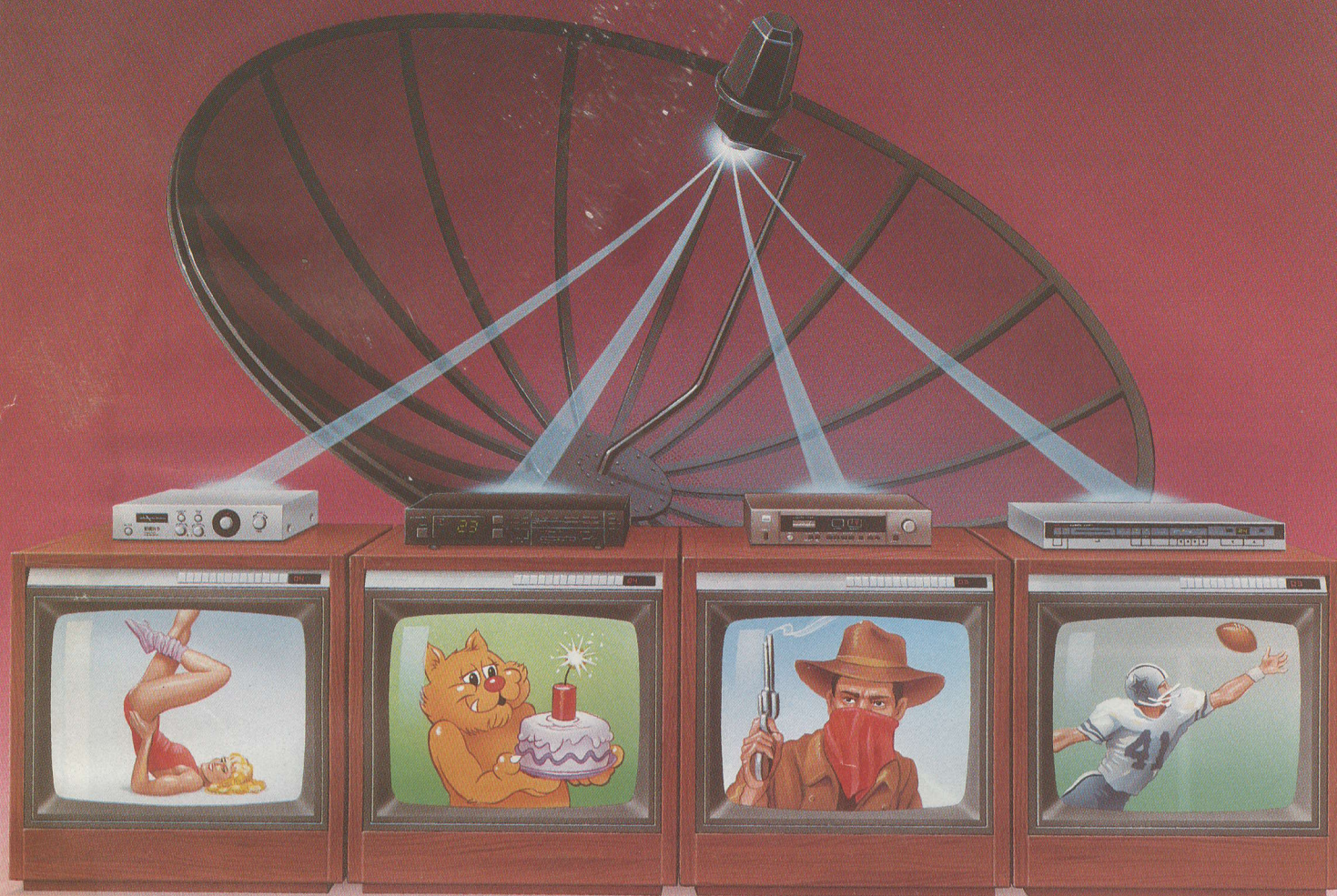
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SYSTEM A: UST-7000 Receiver, UST-441 LNA, UST-550 Block Downconverter	20
SYSTEM B: UST-6000 Receiver, UST-441 LNA, UST-550 Block Downconverter	15
SYSTEM C: UST-5000 Receiver, UST-441 LNA, UST-550 Block Downconverter	10
UST-1000 or UST-3000 Receiver	5
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UST-710 or UST-730 Antenna Controller with UST-770 Actuator	10

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See the Uniden Caribbean Cruise Incentive Program brochure for complete rules and regulations. Photograph above depicts a cruise ship similar to the S/S Norway. Uniden reserves the right to alter or discontinue this program. *You must submit copies of invoices as proof of performance. These must be mailed to Uniden and postmarked no later than August 23, 1985.



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APRIL 15, 1985

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FINDING The Truth

Coming 'off a show' such as Las Vegas requires a decompression period of several weeks. Just wading through the 'rumors' one hears at an industry trade show such as this requires days and days of telephone calls and cross checking. And anyone engaging in this sort of exercise usually comes to the realization that most of these 'rumors' would have been best left 'alone', ignored, from the very beginning.

One 'rumor' that was not a rumor dealt with the questionable tactics of M/A-Com and 'partner' HBO in their handling of the pre-scrambling era. As our lead feature here this issue reports, what we have been 'told' about TVRO receiver compatibility (with descrambler equipment) and what we now know to be the truth are about 180 degrees 'out of phase'. The background is as follows.

A prominent TVRO receiver OEM borrowed a Linkabit VC2C descrambler from a cable system early in February. Naturally he wanted to try the VC2C with his own receivers. He had a surprise; his receivers descrambled the test-scrambled-video from HBO on (then) TR3, Galaxy 1 with no apparent problems. He advised us of his findings and we worked out borrowing the VC2C for a week's time. Naturally we would have liked to have brought the VC2C down to the Provo test lab but there was not sufficient time to do this. So we arranged with a TVRO dealer in Florida to borrow his shop, and his chief-tech, to do our tests. We also arranged to borrow a dozen 'stock' receivers.

Just as the tests were to begin, the test signal on TR3 of Galaxy 1 disappeared in favor of WGN and for a couple of days there was no test (scrambled) video anyplace to test with! But we got 'lucky' and HBO began testing again, this time on TR21 of Galaxy 1.

We had just enough time to get through a dozen or so receivers before we had to return the borrowed VC2C.

We wanted to test all of the really popular (i.e. best selling) receivers first to cover as large a percentage of the 'receiver universe' in place as possible. We missed out on an STS unit because the fellow who sent it down for test 'forgot' to include the down-converter (!) and a couple of others we did receive had 'infant mortality'; dead out of the box. We also wanted to cover the 'range' of receivers; 'cheap' to expensive, single conversion to block.

When this data was 'revealed' in Las Vegas, through some rapidly prepared videotape reports (which are running on BORESIGHT through April 18th), the you-know-what 'hit the fan'. The reaction was electric; the evidence strongly suggested that the industry may have been 'duped' by a clever plan originating from outside our industry.

Now the initial shock is past and we have as an industry vented our anger on those two firms most directly involved, it is time to drop the emotion and try to come to some clear direction for scrambling. Nothing we uncovered and reported from our testing changes the general direction of scrambling; HBO will still go ahead and M/A-Com will still provide hardware to HBO. Yes, there is talk of lawsuits, and damages for those who have been duped, but at best such suits cannot be expected to change the course of scrambling.

If you missed the Las Vegas revelations and you have also missed parts one and two of the series appearing on BORESIGHT (9 PM, TR20, F4) these past two Thursdays, you have one more chance to come up to speed; starting on page 8 here plus on BORESIGHT this Thursday evening (April 18th).

**COOP'S
SATELLITE
DIGEST**
/2



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The new Isis 55 portable satellite antenna

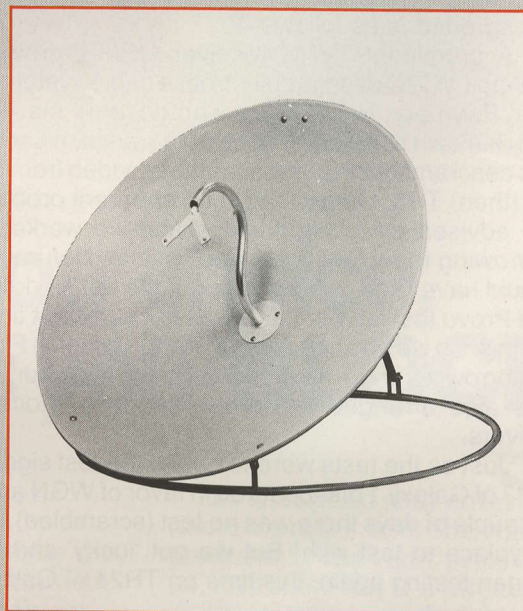
Isis 55 Features

- Marine-grade spun aluminum wall with durable stainless steel hardware
- Low F/D ratio for clear reception
- Ring mount design allows for easy installation and relocation
- Highly accurate surface tolerance means better picture than many similarly sized dishes
- Top quality construction eliminates concern for service
- Economically priced

Other Specifications

Diameter 55 inches
Focal length 16.5 inches
F/D ratio30
Shipping weight 47 lbs.
Low-loss buttonhook (zinc plated)
Three-year limited warranty

The new Isis 55 dish from Isis Electronics, Inc. is the affordable portable satellite antenna with big-antenna performance. The Isis 55 features a hard-alloy spun aluminum wall, tough enamel finish and low F/D ratio for years and years of crisp, clear satellite entertainment. And the Isis 55 is so lightweight and easy to install, it's easy to take it just about anywhere. Compare the Isis 55 to any satellite antenna, big or small.



For information, call or write:



Isis Electronics, Inc.

P.O. Box 3707, Terre Haute, IN 47803
812-234-4033

DISTRIBUTOR Doings

ANTENNA SERVICE CO. (1783 Catalpa Road, Cleveland, Ohio (44112; 216/486-3915) has become a regional distributor for International Satellite Systems. ISS manufactures SMATV modulators, SMATV receivers and other headend equipment for the TVRO industry. (Note: other recent ISS appointments in the distributor line include **CATV Services** of Fremont, Ca. [415/651-4331], **Current Tech** of Tucson, Az. [800/223-5369, extension 272] and **Satellite Systems of Seattle** [206/634-3773]).

BROOKS/ The Satellite Store (Matawan, N.J.) has opened additional new franchise outlets in Wexford, Pennsylvania (11171-A Perry Highway) and Hammonton, N.J. (Hammonton Plaza on White Horse Pike/Route 30). Brooks had stores operating in Florida, NJ, Louisiana, Connecticut, Texas, Bahamas, and Pennsylvania at the end of March.

CSS/ Consumer Satellite Systems (112 Shadowlawn Drive, Noblesville, Indiana 46060; 317/845-4400) has opened its fourth midwestern branch location; Peoria, Illinois. The new 8,500 square foot facility includes a showroom, dealer training region, and 'antenna farm.' The new center is managed by Dave Schultz and is located at 912 Detweiler Drive (61515); 309/692-4630 or 800/367-9531 within Illinois.

CSS has also opened a new SMATV division ('**CSS CABLE**') which will be managed by cable television industry veteran Richard J. Sabino. Sabino comes to CSS from Warner Cable Communications.

ECHOSPHERE CORP. (1925 W. Dartmouth Avenue, Englewood, Co. 80110; 303/761-4782 plus locations in Sacramento, California, Knoxville, Tn. and Dallas, Texas) has been appointed as a 'master distributor' for the new line-up of Panasonic TVRO receiving equipment. Panasonic equipment was first shown to industry dealers at the recent Las Vegas STTI/SPACE show.

ECHOSPHERE has also announced the addition of the Uniden UST 5000, UST 6000, UST 7000 receivers and the UST 710 and UST 730 antenna positioners to their product line-up and, the addition of the Houston Tracker V antenna positioner/controller as well as the STS MBS-SR block TVRO receiver.

FREEDOM SATELLITE SYSTEMS, INC. (505 West Hillsborough Ave., Suite 3-A, Tampa, Fl. 33603; 800/237-4260, or 800/282-7314 within Florida) has released a list of its 17 'franchise store operators.' All, but one, are located in the state of Florida (Pelham, Alabama). Freedom franchise stores operate somewhat differently than others now being 'sold'; individual stores are free to purchase equipment from outside of the franchise chain suppliers.


SatNet/ISDA, the International Satellite Distributor Association (P.O. Box 2025, West Lafayette, Indiana 47906; 317/742-4652) is now considering expansion of its national program to take in additional 'regional distributors' to the fold. ISDA was founded in 1981 as the original two-step distributor 'trade organization' and it has grown by providing member distributors with unique products available only through members, and by insisting that member distributors supply dealers with total backup in equipment and services. The group supports 'two-step distribution' and will be working during the balance of 1985 to increase its visibility in the industry.


SATELLITE VIDEO SERVICES, Inc. (RR#1, Paul Saxe Rd., Catskill, N.Y. 12414; 800/528-DISH or 800/831-DISH within New York) will be holding the following schedule of seminar sessions over the next 45 day period: **April 17 (Block conversion and SMATV techniques)**, **April 24 (Intersat IQ-160 and 170 technical training)**, **May 8 (Advanced Technical Installation)**, **May 15 (Luxor receivers and drives)**, **May 22 (Block conversion and SMATV techniques)** and **May 29 (Intersat IQ-160 and 170 technical training)**. Seminar training sessions run from 1 to 4 PM on the dates shown and advance registration is required. There is no charge for the sessions. Additionally, new dealers will be interested in attending 'Basic Installation Training' sessions held from 9:30 AM to 2 PM on April 20 and May 18.

RECEIVER Ramblings

BASIC SYSTEMS (1919 South 129 East Avenue, Tulsa, Ok. 74108; 918/437-7066) has added a third (and final) receiver model to its line-up of American built block downconversion type receivers. Model 3400 claims a 7 dB threshold, has a continuous tune control knob and AFC. Other features include continuous tune for audio

NEW PRODUCTS/ SERVICES/ EVENTS

 **BEER BUDGET**
receiver from CM

 **STRAIGHT AHEAD**
for Chaparral

subcarriers, polarization rotation control, signal level meter, and a channel 3 or 4 crystal controlled switchable modulator. Model 3350, previously released, has these features plus a built-in actuator drive control. Prices range from \$198 to \$225 depending upon quantity.

CHANNEL MASTER (Division of Avnet, Inc., Box 1416, Smithfield, NC 27577; 919/934-9711) has announced a pair of new receivers for TVRO. Their model 6131 is designed to be 'price competitive' with a retail price of \$329.95. The receiver is a single conversion unit with analog signal strength meter, audio tuning (continuous), polarization selection, transponder format choice and either channel 2 or 3 VHF remodulated output.

Model 6136 is a microprocessor controlled deluxe block downconversion unit with full remote control and antenna, stereo, digital audio and video tuning, and parental lock-out. Model 6136 is interfaceable with model 6255 'Satscan' antenna positioning equipment. This unit has a retail price of \$1,095 (see CSD review, page 30, for April 01, 1985).

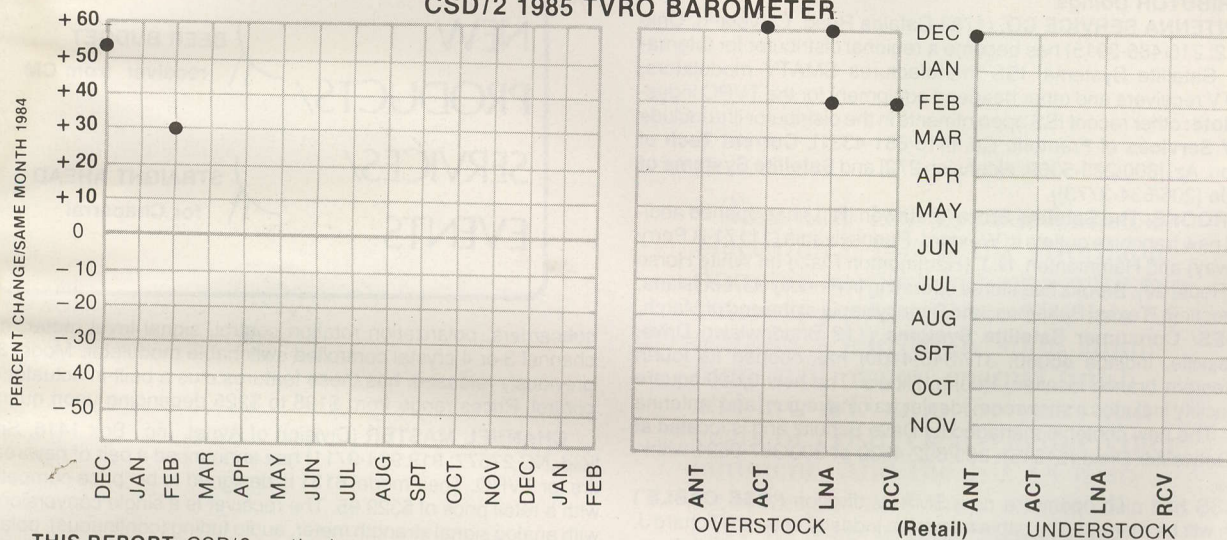
ESP, INC. (2532 Regency Road, Lexington, Ky. 40503; 606/278-1209) has created an improved version of their popular TVRO 'TI' filter package which the firm reports should increase the 'flexibility' available to the dealer in resolving TI problems. The new PG-series filter has a bypass switch in the unit allowing the user to switch 'around' the filter on those transponders or satellites where no filtering is required. Additionally, the new filter unit has a user adjustable gain control covering a -4 to +2 (dB) range. Another new product from the firm is a line of filters for **134 MHz** IF receivers (i.e. Uniden UST 1000 and 3000 units and others).

R.L. DRAKE COMPANY (Miamisburg, Ohio; 516/866-2421) has begun a 'Dealer Incentive Program' to increase the firm's product penetration during 1985. Drake's number one position in the marketplace is aptly reflected in the firm's new "**Tune Into Your Future With Drake**" theme which will award 'credits' to dealers who retail the firm's products during the incentive program period, which ends on October



BYPASS and Gain Control from ESP, Inc.

CSD/2 1985 TVRO BAROMETER



THIS REPORT: CSD/2 routinely surveys approximately 300 TVRO dealers each month to determine (1) how business for the last complete (calendar) month compares with the **same month** in 1984; (2) whether four primary equipment items were in dealer **'overstock'** (i.e. **too many** in-house) or **'understock'** (i.e. supplies dangerously **low** at retail level). This serves as TVRO's "industry barometer" of equipment trends at the retail/dealer level.

15th of this fall. Prizes for those dealers who install the greatest number of Drake systems during the program period will include all expense paid trips for two to the **Drake Satellite College** to be held in Orlando, Florida (adjacent to EPCOT and Disney World), and grand prize trips to Paris, France.

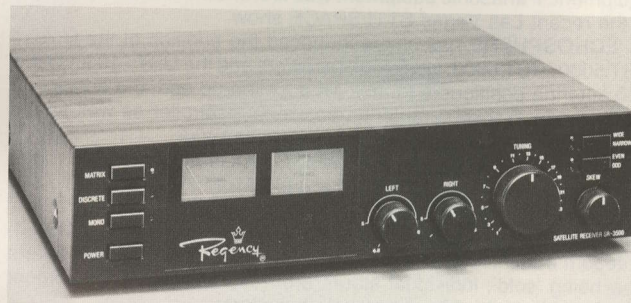
DRAKE is also increasing its R and D (Research and Development) budget by increasing the R and D staff 40% over the next six month period. Drake is currently seeking out design engineers with backgrounds in TVRO, commercial satellite equipment, CATV and SMATV equipment.

GILLASPIE COMMUNICATIONS, INC. (355 Sinclair Frontage Rd., Milpitas, Ca. 95035; 408/943-8800) is now located in a new 16,000 square foot facility which firm President Dr. Pang T. Ho reports will be used for increased R and D and new product development for data communications, video teleconferencing, satellite audio and satellite facsimile equipment.

ICM VIDEO (10 North Lee, Oklahoma City, Oklahoma 73126; 405/232-5808) has introduced a new CATV/SMATV block downconversion receiver; their model SR4650P, mated with a new commercial grade block downconverter, model DC-65. The new 950-1450 MHz block system claims a frequency stability of ± 0.5 MHz, and says the new receiver is fully compatible with the M/A-Com Videocipher 'family' of descrambler equipment. The receiver is rack mounting, has a signal to noise ratio (at baseband) capability of 55 dB, RF AGC, with manual override, an optional remote control capability and a 70 MHz IF loop through for TI filtering requirements. Pricing is \$590 for the receiver and \$180 for the block downconverter.

INTERSAT CORPORATION (1000 Lake St. Louis Blvd., Lake St. Louis, Mo. 63367; 314/625-4617) is demonstrating their new IQ-170 computer aided TVRO receiver. The 170 is the successor in the IQ family which began with the 160 unit more than 18 months ago. The new receiver has greatly increased graphics and remote control capabilities with more than 50 on-screen 'menu' and 'information' displays.

REGENCY ELECTRONICS, INC. (7707 Records Street, Indianapolis, Indiana 46226; 317/545-4281) has created a block downconversion 'stereo' TVRO receiver; their model SR3500. The new receiver will handle discrete or matrix transmissions and has a signal strength meter plus tuning meter, built-in polarization control for Chapparral 1 unit, a channel 2 or 3 modulator and a built-in A/B switch for compatibility with the SR-5000 block system for dual feed installations. List price, including the BDC unit, is \$559.95 and an optional wired remote control is also available.



SIMULATED WOODGRAIN/ Genuine BDC Stereo from Regency

SAT-TEC SALES, INC. (2575 Baird Road, Penfield, NY 14526; 716/586-3950) has introduced an upgraded 5000-series TVRO receiver with no increase in price. Their model R5000XL has a Polarotor 1 interface which includes a skew control for fine tuning of polarization (with built-in electrical protection against electrical overload), an A/B (electronic) switch to select between off-air (TV) and satellite programming, and a crystal controlled modulator switch selectable between channels 3 and 4. The downconverter, the DC-5000, uses coaxial cables for both the IF and the powering lines, F connectors, and is weatherproofed with an epoxy coated zinc case.

SAT-TEC has also begun shipping their new R-5100 block downconversion receiver which includes Polarotor 1 interfacing with skew control and skew protection, built-in A/B switching for external TV antenna and a newly developed AFC system for channel stability using DRO technology. The new BDC outdoor mounting unit has been designed to allow 'breathing' to prevent moisture build-up internally while still being weatherproof in the environment.

SCIENTIFIC-ATLANTA, INC. (Box 105027, Atlanta, Georgia 30348; 404/925-5308) has issued a formal announcement of its return to the home TVRO business; or **'Homesat'**™ as S/A coined and then registered to their own use back in 1979. S/A pioneered home terminals in 1979 with a \$36,500 home package which was widely promoted at the time. S/A is bringing out a full line of TVRO antennas (solid and perforated), receivers featuring BDC designs and LNBs of their

NEW PRODUCTS/ continues on page 30

**"HOOSIER'S LOW PRICES
CAUGHT MY ATTENTION...
BUT DELIVERY, SERVICE AND
SUPPORT GOT MY BUSINESS."**

Mike Speasel
TVRO Dealer, Decatur, IL



It's great to have a satellite distributor you can rely on. Sure, most of them offer competitive prices...and Hoosier Electronics' are more than competitive.

"But that's only the beginning with Hoosier. Hoosier is around long after the sale. Hoosier keeps a multi-million dollar inventory, so I know Hoosier's got what I need, when I need it. And Hoosier follows through with application assistance and an industry-leading service and repair facility staffed by experienced service technicians.

"Sometimes, things get hectic in this business. But you'd never know it from dealing with Hoosier. Hoosier is always friendly and willing to answer any of my questions. The personal rapport I've built with Hoosier is something

that can't be sold. But it's one of the reasons I've bought from Hoosier for years."

Before you choose a TVRO distributor, look at the big picture. Hoosier Electronics' low prices and total service commitment make the choice crystal-clear. For further information about Hoosier's complete line of TVRO equipment and accessories, write or call toll-free today.



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THE GREAT TVRO DESCRAMBLER ILLUSION

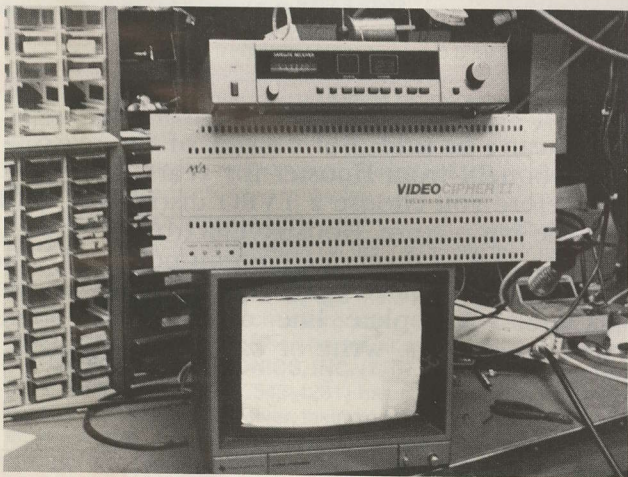
BACKGROUND

Home Box Office has been promising to scramble their satellite TV feeds since 1980. The firm chose the Linkabit Videocipher scrambling system after several years of searching for the 'right' system and from 1983 onward M/A-Com and subsidiary Linkabit have been demonstrating their system for HBO in a wide variety of forums.

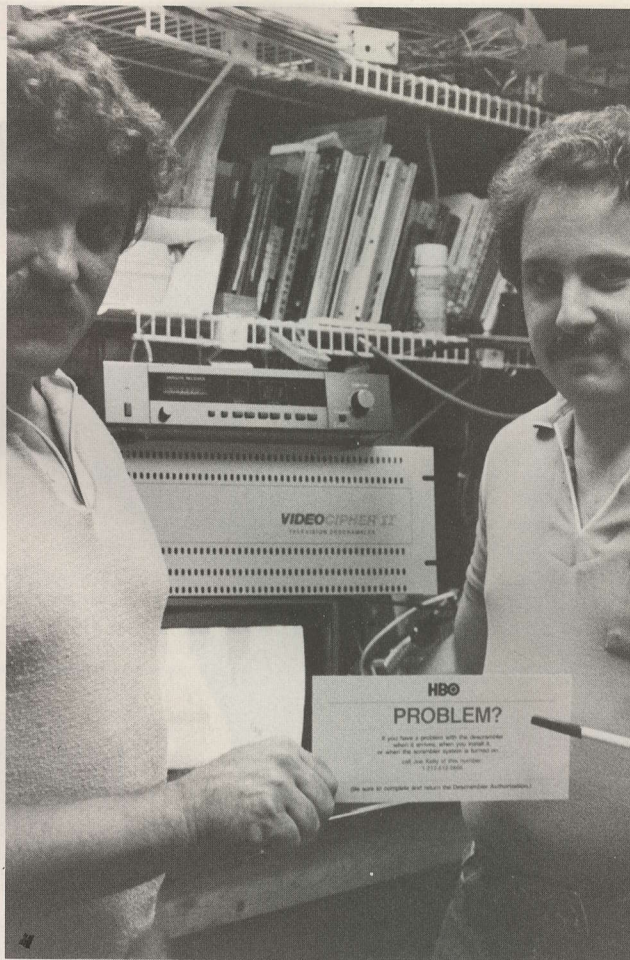
The original Videocipher system demonstrated was very complex, and very costly. The video was converted from 'analog' to 'digital' and the video information was 'segmented' into random pieces of picture lines so that you had a giant jig-saw puzzle to put back together again. The audio was also turned from analog into digital signals and then it was 'buried' in the video 'data stream'.

Alas, the complexity of the system proved to be ahead of the ability of IC (integrated circuit) suppliers to deliver; for such a system to function outside of the laboratory required a level of complicated 'LSI' (large scale integration) and 'VLSI' (very large scale integration) devices that did not yet exist. So the Videocipher program 'fell back' to a less complicated technology.

When HBO began actual tests of 'the system' the last week in November of this past fall, we saw the fall-back position; video which was scrambled because the video itself had been inverted in polarity and the synchronization signals had been 'stripped' away, and, audio which continued (ala the first Videocipher format) to be digital (and encoded). Prior to the actual tests of the system on satellite, Linkabit supplier M/A-Com, which also happened to be in the TVRO receiver (LNA, antenna) business had been releasing 'snippets of data' designed (they said) to 'assist other receiver OEMs to prepare their own engineering so that all receivers could be scrambling-compatible'.



PROOF of DX-700 service; receiver on top, VC2C and the video monitor below. The three left-hand LEDs are 'on' indicating powering, sync and authorization.



HBO PROBLEM? Not for TVRO dealers Frank Abruzzo (left) and Jerry Fischette. Card packed with VC2C advises cable systems what to do when something fails including 'hot line' number (Joe Kelly at 1-212-512-5666).

The first public exposure of the 'receiver compatibility requirements' appeared in CSD for August 01, 1984; a source within M/A-Com had shared the new receiver requirements with CSD and we promptly shared them with the industry. Between the August 1st publication of that data and November 1st, M/A-Com accepted 'letters' from receiver manufacturers requesting that final, detailed data be supplied to their engineering departments. Finally on November 1st, M/A-Com began sending out 'data packets' as requested.

At about the same time another M/A-Com created and paid for mailing was going into the mails. This one, out of Salt Lake City, was directed at virtually every 'known' TVRO dealer in the country, using a mailing list obtained from an Idaho publisher. And this mailing told the reader that "M/A-Com had the inside track" because (they claimed) "No other receivers (are) compatible with Linkabit." Naturally this mailing upset a lot of people. The receiver OEMs, who had been dealing with M/A-Com and HBO in good faith were angered because they now felt that M/A-Com had stabbed them in the back (see CSD/2 for November 15, 1984). TVRO dealers who were not handling T1 and H1 receivers were angered because it appeared to them that M/A-Com was attempting to 'force them to handle the T1 and H1', perhaps against their wills or better business judgement.

The crux of the message in the M/A-Com mailing was simply that:

- 1) Only those receivers which had been designed to be Videocipher compatible would work with Videocipher, and,
- 2) Only M/A-Com had designed these features in because (as

they said) "M/A-Com gets the inside track".

The matter came to a head at the SPACE Board of Directors meeting held during the November Dallas STTI show where SPACE decided that it had to support a 'level playing field' whereon every receiver supplier had an 'equal opportunity to supply compatible receivers' to the industry dealers.

SURprise

The first VC2C descramblers began arriving at cable headends late in December. By the end of January several thousand were in the field and HBO was transmitting 'instructions' to cable engineers using TR22 on F3R detailing the installation of the VC2C. One of the early-shipped VC2C units found its way into CSD hands. **This was an authorized unit** and we obtained it through an HBO affiliate (a cable firm) as a loan.

The unit was taken to a Fort Lauderdale (Fl.) dealership operated by **Frank Abruzzo**. He is a member of the SPACE Dealer Board of Directors and has been in the business for more than four years doing SMATV and home system installations throughout Florida and the Caribbean. Also on hand to witness the testing was another SPACE Dealer Board member, **Jerry Fischette**, of Victor, New York. Fischette is another 'veteran industry dealer' dating back to virtually the inception of the industry.

To preserve the tests we videotaped the entire operation for several days time. We subsequently created a trio of reports, each about 12 minutes in length, showing viewers how the tests were conducted and what the results of the tests were. All three reports were shown in our CSD/BORESIGHT Las Vegas booths during the recently concluded SPACE/STTI show and portions of the tapes were also shown to the full SPACE Dealer Board and to other groups at Las Vegas. Subsequent to Las Vegas, the reports have aired (April 4 and 11) and will air (April 18) on the BORESIGHT program.

This, then, is a written report on our testing results and here you will be able to learn detailed information on the actual 'compatibility' of the VC2C descrambler with the receivers selected for test. A word here about the receivers chosen for test.

- 1) Ideally, we would have tested each of the 80+ receivers available to the industry. HBO and M/A-Com **claim** they have done this.
- 2) Realistically, we were only able to test those receivers which we could 'borrow' on very short notice. The receivers tested do represent a wide variety of receiver design approaches; from inexpensive single conversion units (Sigma-Vu and Toki) to more elaborate double-conversion units (such as Earth Terminals and USS/Maspro) and some block conversion units (such as the DX-700 unit).

TEST Approach

The VC2C manual explains that you **MUST HAVE** unfiltered and unclamped video with appropriate video polarity. Of all of the receivers we had available for test, only the DX-700 receiver (a block conversion unit) had an appropriate rear-panel jack which purported to have this sort of video waveform available. The M/A-Com data released to the industry's receiver OEMs this past fall also specified certain video-purity requirements IF the VC2C was going to function properly. **We show those specs separately here** and then we also show what we measured on one of the receivers tested for each of those parameters.



ALLI LAKE puts his talents to work finding the appropriate point in the receiver to drag out unclamped video to feed the VC2C.

With most of the receivers, we popped the lid off and Chief Tech **Alli Lake** of **The Satellite Link** searched for the appropriate point within the receiver where you had the unfiltered and unclamped video. It happens that about half of the receivers with a 'video polarity switch' have this video waveform present at that switch. The other half may have the video unfiltered at the switch but it is often clamped before the switch.

Lake searched in the receivers (many of which he had not previously dissected and none of which had schematics available as an aid) with an oscilloscope probe locating the appropriate video waveform. Then he would attach a coupling capacitor to the video at that point and through the coupling capacitor connect the video to the VC2C input.

The VC2C has a video input (from the receiver) and a looped (pass through) output. The theory here is that a cable system **could install** an in-line always active ('hot standby') backup unit for the primary VC2C. The manual is less than clear on the need for the looped-through video output to be terminated, or not terminated, in use. It has an unscrambled video output as well and a set of audio output terminals. The audio output terminals are for left and right (as in stereo), and mono. Present HBO and Cinemax transmissions are in monaural only but there is the promise that they will one day be in stereo.

The 'stereo capability' of the Videocipher system is one of the 'selling advantages' which M/A-Com touted to HBO. The Oak Orion system, which turns out to be very much like the Videocipher, has no stereo capability and this shortcoming is one of the few significant differences between the two system's operation.

One terminal strip of special interest to us, it would turn out, is labeled 'TB1'. There are nine screw tie-down connections here and they have labels such as CLK (clock) + and -, and DATA + and -. We'll return to them later on in this report.

When you have the video output from the receiver connected to the VC2C input, and the VC2C turned on you will see two of the four

M/A-Com Requirements and CSD Tests

In the left hand column, you see the requirements released by M/A-Com for 'Videocipher Compatibility.' According to M/A-Com, unless a receiver met or surpassed these specifications, the receiver would not function with a descrambler. On the right is a set of measurements from a Drake ESR240 receiver. The text here reports on the ease of installation plus the 'rapid lock up' to authorized descrambling of the ESR240 model receiver in spite of apparent failure of this 'family' of receivers to meet the **M/A-Com** specifications.

M/A-Com Numbers

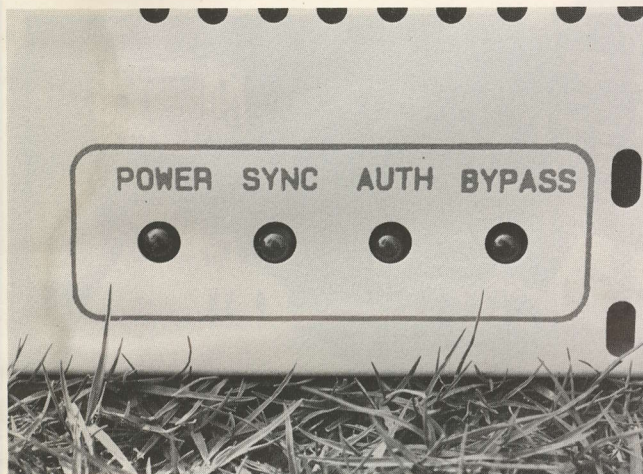
± 0.5 dB
50 nanoseconds (50 Hz to 4.2 MHz)
0.95 to 1.05 volts peak to peak
5% peak to peak maximum
4 degrees maximum peak to peak variation

Specification

Variation in gain from 50 Hz to 3.58 MHz
Variation in Group Delay
Video input level to VC2
Differential Gain
Differential Phase

CSD Measured (ESR240)

± 1.4 dB
Greater than 75 nanoseconds
0.8 volts
Greater than 8%
Greater than 6 degrees peak to peak



STATUS LEDs/ Power and Bypass come on when unit is powered up. SYNC comes next followed by AUTH(ORIZATION) when the picture finally snaps on the screen in an unscrambled mode.

front panel LEDs (light emitting diodes) illuminate. The far left, marked power and the far right, marked bypass, light. The trick is to get the two middle lights to come on.

The second from the left light is marked SYNC and this LED 'fires' when the VC2C recognizes the descrambling code and begins to process the signal. M/A-Com had warned us that the descramblers had to have between 0.95 and 1.05 volt peak to peak video into the descrambler if we were going to expect the descrambling to occur. So naturally we were concerned that we could adjust the unfiltered and unclamped video baseband out of the receiver under test to this narrow range (either side of 1 volt peak to peak). It would turn out that we didn't need to be bothered with this level after all.

When the SYNC light does fire, the manual suggests that you may have to wait up to two minutes for the initial VC2C circuit 'tracking'. Here is what is happening at this point.

- 1) The VC2C has an internal 'AGC' or automatic gain control system. It drives or regulates the innards of the VC2C and there is a very wide voltage range (which the installer can measure from the rear of the unit with a digital VOM) of from approximately 11 volts negative to 11 volts positive which this AGC 'steps' through.
- 2) This AGC range is an internal range and it has no bearing or direct one-to-one relationship with the actual input video peak to peak signal voltage.

Think of this voltage as a 'road map' or 'reporting system' which can be conveniently monitored from outside the VC2C. With a digital VOM, the installer can monitor what is happening inside of the VC2C and have some way of knowing what to expect, and when, in the way of performance.

This AGC adjustment happens very slowly (i.e. it is 'damped' and has a very long time-constant) and there is ONE installer adjustment on the back apron of the VC2C which must be adjusted to insure that the 'AGC window' of this internal circuit is in the right ballpark.

Once the SYNC light (LED) has come on, you wait for this slow moving internal AGC system to find the correct range and then 'do its thing'. As those who saw the BORESIGHT reports may recall, at this point Alli Lake sat back on his stool and said "And now we wait...".

You may wait forever and the unit may **never authorize**. Why?

- 1) Perhaps the unit is not an 'authorized unit'; that is, the individual address code of the unit may not match any of the address codes being transmitted 'down the line' by the satellite feed.

Each VC2C has an individual electronic address. There are two operational modes for the Videocipher system; 'open key' where all of the VC2Cs out there are authorized and 'closed key' where only those which are being specifically 'addressed' by the uplink encoder and computer are authorized.

- 2) There may be some problem in the video waveform which your

VC2C is receiving from your receiver.

Remember that M/A-Com had warned us that the video must be exceptionally pure (see table here) or the Videocipher descrambler will not descramble. Internally, at M/A-Com and HBO, they have assigned a 'point system' to the grading of receivers. Parameters such as 'video peak-to-peak level', differential phase, differential gain and so on are each assigned a 'weighted number'. They have found, we understand, that if any combination of the weighted numbers for an individual receiver adds up to 70, the unit will function. Below a 'grade of 70' the unit performs marginally or not at all.

TURN On

There is a 'set up' sequence with the VC2C; the user must make the AGC window on the VC2C adjust to the proper region, given the input peak-to-peak video drive coming from the receiver. This is basically a one time 'set and forget' adjustment and if set properly and if the receiver has reasonably stable peak-to-peak output, you should not have to re-adjust anything after the initial setup.

When this internal AGC window has adjusted itself to the proper range, the AUTH(ORIZED) LED lights up, you hear a small relay inside the VC2C 'click' and video appears on the screen and audio in the speaker. The Bypass LED also switches off at that point since the unit is now 'authorized' and operational.

Automation Techniques GLR750

In a strict sense, the GLR750 is not a home receiver. However, it is very similar in concept and design to Automation Technique home style receivers and certainly thousands are in use at SMATV headends all over the North American continent.

Our unit was serial number 089207, and the unit was produced more than three years ago. Alli cap-coupled the video waveform from the (blue) lead going to the video invert switch and that is the same point as the collector on an MPS 3646 transistor.

We measured 0.25 volts peak to peak video with an external terminator on the VC2C loop-through output. The VC2C internal AGC ran quite high on this receiver before we achieved 'lock-up' (10.25 volts). The picture, once authorized, was stable and we could change transponders (away from the TR21 test signal and back again) and wait less than 20 seconds for the signal to 're-authorize' and lock up. The audio was noisy but not uncomfortable.

Alli rates this receiver as 'rather touchy' to 'lock-up' indicating that it would be a 70-region marginal performer. But, it did work!

(R.L.) Drake ESR240

This receiver was serial number 4070499. Drake has made a circuit board trace provision for unclamping the video. You are grounding diode D13 which serves as the clamp and coupling out to the VC2C through the receiver's rear apron 'composite output' after removing the clamping diode from the circuit. We measured 800 millivolts (0.8 volts) peak to peak video at this point.

After an initial false start because we were using the 250 with a different downconverter than it had previously been used with (requiring some slight re-adjustment of the fine tuning pot internally for the receiver) we achieved AUTHORIZATION quickly. The video was clean and the audio was clean.

One of the concerns voiced by M/A-Com was that the users of the system must be able to switch to a scrambled channel and achieve AUTHORIZATION and clean video in a very short period of time. In a fixed situation, such as using the GLR 750 in an SMATV or cable headend where there is no changing of channels, the 'lock up' period is not important because the receiver will never be switching between scrambled and unscrambled signals.

We put the ESR240 to a series of tests as follows:

- 1) Once we were authorized, **we turned off the power on the 240** and waited a few seconds; then we turned it back on again.
- 2) We timed the amount of time it took for the receiver to re-authorize on the scrambled signal.

In the BORESIGHT videotape, you may notice that we timed this sequence at just over 4.5 seconds; from receiver turn on to descrambled video on the screen. This was actually **the worst case measured** and the typical time span was just over 3.0 seconds. We also found that if you switched to the scrambled transponder (21) from a non-scrambled transponder, the 'lock-up' time was under 2 seconds



UNCLAMPED VIDEO through DX-700 is clean.

typically. Alli felt that some minor playing inside of the ESR240 would improve that to the 0.5 second region.

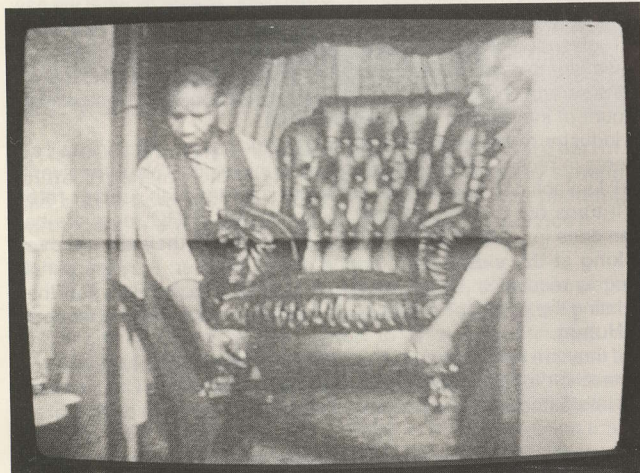
DX Model 700

The DX-700 is a block downconversion receiver which was released early last fall. DX engineers, acting on what they felt would be required by the Linkabit scrambling system, created a special set of circuit changes inside of the 700 unit so the user could be 'Linkabit compatible'. On the rear apron of the DX-700, for example, there is a switch marked 'clamped' and 'unclamped'. Operating this switch does what Alli did inside of the Drake ESR240; it sends unclamped video to the rear output jack making the receiver switchable between a 'compatible' and 'non-compatible' function.

DX-700, serial number L403047, immediately AUTHORIZED when connected to the VC2C. We tried the operation with the clamp position in both positions and found that once authorized the VC2C didn't care whether the video was clamped or not. We did notice a slight black bar across the screen in the clamped mode. In the unclamped position, the video was excellent and the audio clean and noise free. From switch-on to lock-up was under 5 seconds.

EARTH Terminal

This was the only receiver which we could **not make** properly authorize. However, we know why. Most of the available video in the receiver is inverted sync or positive video. We did manage to unclamp



CLAMPED VIDEO through DX-700 had light black bar (center of screen) but otherwise we descrambled OK.

the video and we could get the SYNC light to come on with the VC2C (from either the normal video out or composite out). Alli 'knows the fix' but in the interest of getting through as many receivers as we could, before losing use of the VC2C, we passed on completing this unit at this time.

Note that most independent tests of receiver video quality have found the Earth Terminals video quality in the top 5 to 10% of all receivers in the field. Our failure to attain AUTHORIZATION is not a reflection on the video quality of the unit; it merely says that Earth Terminal units will require a slight modification kit to get into the VC2C business.

LUXOR Skantic Mark 1

This receiver provided quite a surprise. Serial number C438209, we were having some difficulty locating (without a schematic) a point where we could **unclamp** the video. So before giving up we simply plugged the VC2C directly into the video output jack on the rear of the receiver where we found 0.5 volt peak to peak video.

And then as Alli tweaked on the receiver's fine tuning control set-up, the receiver suddenly authorized! In effect, it was compatible with the VC2C even though **we had done nothing** but play slightly with the receiver's fine tuning set control for transponder 21.

What we found was that **if you started slightly off center**, on the low side (i.e. towards transponder 19), you would find a point where the VC2C would authorize. when the picture came on screen, it had that grainy look that goes with being slightly off-tuned. **Once authorized**, you could **then** re-tweak the fine tuning and bring the picture out of the grain or noise.

Certainly there are some minor changes which a field tech would make to simplify this off-center-tune process for Skantic Mark 1 users. The important point here is that even as a 'stock' receiver, all that it took to authorize was some minor playing with the fine tuning set control. So much for M/A-Com's tight specs.

McCullough Communications Model ELX24S

By all rational reasoning this receiver had no business being tested. We had this specially adapted receiver heading for Provo where it was going to be used on the Russian Gorizont Moskva transponder 1 minus service. Haden McCullough had modified the receiver's video section **for 625 line SECAM de-emphasis**; not a recommended procedure when you are trying to be Videocipher compatible!

But we tried it anyhow (serial number 5PSB21446) and it worked! Alli found a baseband video output of 0.7 volts peak to peak and in short order had the SYNC light on. The authorization light took quite a while however since it was difficult to make the tuning track with the modifications inside the unit. But it finally did and once authorized would go off and come back authorized. SECAM Videocipher anyone?

SIGMA-Vu

New York dealer Jerry Fischette brought this unit along for test. The Sigma-Vu is a relatively new off-shore built product sold out of Arizona. Our Mark 2A (serial number M002587) was a single conversion package not unlike some of the lower cost off-shore imports. On non-scrambled channels we were very impressed with the quality of the video however.

Alli found that he needed to locate a pin diode at the rear center of the unit (MPN 3401) and cut the trace on the diode where a disc capacitor and electrolytic capacitor connected to the diode. This pin diode is the clamp for the video and by applying a positive voltage (between 1 and 5 volts) to the diode he was able to unclamp the diode. After doing this, we simply plugged into the normal video output and connected to the VC2C.

We experimented with various video levels out of the Sigma-Vu receiver to see how responsive the VC2C was to video drive level. We ran levels of up to 1.5 volts peak to peak (and down to 0.25 volts peak to peak) and found the AGC range within the VC2C tracked them all with ease (after adjustment of the VC2C AGC pot) and the receiver authorized in each case with AGC voltages of from 5.2 to 7.1 volts DC. Video and audio were excellent.

A dealer shop modifying this receiver for VC2C use would install a small switch on the rear of the unit and run a pair of wires to switch the bias on the clamping diode on and off. That's about 15 minutes time

and \$1 in parts.

TOKI Model TR110S

The Toki single conversion receiver represents the low-end, not terribly sophisticated receiver packages often offered in low-end systems by dealers. The feeling was that if we could make the Toki 'play', most any other receiver would also 'play'.

Serial number 4BS005617, Alli found he had to lift diode CR2 (video clamp) and couple the signal out to the VC2 through a 10 MFD coupling capacitor. The VC2C displayed the SYNC light within seconds but the AUTHORIZATION LED waited several minutes to come on as Alli tracked the VC2C AGC range. We also found that we had to leave the VC2C look-through terminator out of the circuit although the terminator on the video monitor was in place.

Video quality was acceptable but not great and the audio had some noise in it; however, we noticed the same general quality on the non-scrambled Galaxy 1 channels as well. In short, the VC2C authorized even though the video quality was not good and the audio played even though it was noisy.

Uniden UST-1000

We found several ways to make the UST-1000 play with the VC2C and we'll share the best of these approaches with you. This was serial number 43002168.

Our suggestion is that you lift clamping diodes D114 and D115 and then take your video from the **video output jack** on the receiver. Yes, that still leaves the so-called filtering in place but that did not seem to shut the system down. These diodes could be 'lifted' with a switch mounted on the back terminal of the receiver in a retrofit situation.

Initially we could not get the VC2C to authorize although we did get the SYNC light to come on in the 7.5 volt AGC range of the VC2C. The system finally played when we removed the loop through terminator from the VC2C and from the video monitor as well. We could switch from TR21 to another transponder and then back to TR21 and have re-authorization in around 10 seconds time.

The UST-1000 would probably authorize more rapidly if the receiver was connected to the VC2C prior to the video filtering. We wanted to see if we could make it operate by merely removing the clamping and by golly we did!

USS/Maspro SR2D

This multiple-conversion receiver gets high marks from receiver engineers for its high quality video. We went into the video invert (polarity) switch with a clip lead and capacitor and directly to the VC2C.

The SYNC light immediately comes on and the authorization came on, after setting the VC2C AGC level, in about 80 seconds time. Once the receiver and SR2D 'knew' one another, we could switch from TR21 to another and back again and have re-authorization in around 3 seconds time or less. It was possible to get almost 'instant' re-authorization about every second time we hit the switch for TR21.

RECEIVER Test Synopsis

Of the ten receivers detailed here, only one failed to authorize. M/A-Com has warned us that for the VC2C to authorize, the receiver video must be unclamped and unfiltered. They also warned us that the video has to have very rigid specifications; the type you expect only to find in \$2,000 (and up) commercial quality receivers.

We found that even if the video was clamped (DX-700, Skantic Mark 1) the VC2C worked. We found that even if the video was 'filtered' (Sigma-Vu, et al) the VC2C worked. And with the possible exception of the DX and USS SR2D, none of the receivers came even close to meeting the 'mandatory video purity' requirements circulated by receiver.

After finding the appropriate spot in the receivers to pull out the unclamped video (where required; about five minutes time) and setting the VC2C 'AGC Window' to the appropriate range (from 1 minute up depending upon the receiver) we had authorization in each case. We also found that once the VC2C and the receiver were 'comfortable with one another' the 're' authorization period required (time it took for receiver to re-lock up when returning to the scrambled channel) varied from almost instantaneous (USS/Maspro) to a few seconds (Drake) to a minute or more (Luxor). It was our judgement that most of the receivers tested could be made to re-authorize in the 'seconds' region

with some minor modifications within the receivers proper.

We also found that when the receiver produced noisy audio on a non-scrambled transponder of equal strength to TR21, it produced noisy and 'popping' audio on the scrambled channel. However, there was a background noise level that was as irritating or more so than the popping with at least the Toki unit.

WHY The Fuss???

So one must ask 'why did M/A-Com release and insist upon the tight and rigid receiver specifications when it now appears that these specifications are not necessary?'

There are a number of possibilities.

1) The specifications are a mistake; somebody screwed up at M/A-Com and the mistake also 'slid-by' HBO engineers as well.

On a scale of 1 to 10, that possibility probably rates a 1.

2) The specifications were intentionally made 'rigid' because receiver manufacturers complying would be required to spend additional dollars to comply, thereby driving up in price the mid and low priced equipment. Why? The M/A-Com T1 and H1 are certainly in the 'top end' class and by 'forcing' those priced lower to increase their prices, the gap between the two would narrow, making the T1 and H1 more dealer attractive.

On a scale of 1 to 10, that possibility probably rates a 3.

3) By focusing attention on the 'tight specifications' and by directing dealers to the claim that "Only M/A-Com receivers (are) Linkabit compatible" the marketing department at M/A-Com is able to achieve some sales advantage over the competition. The entire scenario to date certainly does reek of 'confusion', and in a confused marketplace, the long-standing claim that "Only M/A-Com is Linkabit compatible" might have some positive effects for the sale of T1 and H1 receivers.

On a scale of 1 to 10, we rate this possibility at a 5.

4) And then there is the 'hidden plan' scenario. Suppose that the rigid specifications we have been told are for descrambling Videocipher **video** really have very little to do with descrambling television; suppose they really involve an entirely different type of service?

Remember those outputs on the back of the VC2C marked 'clock' and 'data'? They are there to produce a special output, a special set of electronic data, removed from within the VC2C from the television signal.

The test signals already operating during March on transponders 3 and 21 also had high speed data buried within the TV signal. Some of that high speed data is 'addressing information', or specific instructions required by the VC2C to tell it that it is, indeed, 'authorized' to descramble the video. But that sort of addressing requires a very insignificant amount of the total 'data room' within the signal. There is additional room, for example, to electronically deliver the entire day's edition of **The New York Times** to a viewer's living room in a matter of minutes. This type of high speed, 'serial data', is exactly what we saw being tested on the TR21 feed late in March.

High speed data is not nearly as forgiving of noise and 'glitches' in the waveform as television is. A lost pixel of video is simply one lost dot on the screen. The same noise 'burst' in data could lose a significant amount of information or a control signal.

Industry receiver engineers, in communication with Linkabit engineers in recent weeks, have been told things like "Your receiver is NOT Linkabit compatible; the 'error rate is far too high'." **Error rate?**

It turns out that the Linkabit testing of the TVRO receivers has been done in a laboratory simulated situation and **they are not even looking at the video** performance of the receiver; they are simply trying to recover that high speed data 'stream' on TR21 and then 'counting the errors' or mistakes caused in the circuit by the receiver.

Humm.

If they are not looking at video, not measuring how long it takes for the receiver to 'authorize' and 're-lock-up' as we did at CSD, **but** are only interested in the high speed data 'error rate', what does that tell us?

Certainly Linkabit could build a 'story' around how **they use** the high speed data and its built-in 'error-counting ability' to **really judge**

SCRAMBLER ILLUSION/ continued from page 12

the performance criteria of a receiver. That IS a good way to measure a receiver. But to tell a fellow receiver OEM that his receiver is NOT compatible because of the error rate, well, that is quite another matter (especially when CSD found the same receiver WAS compatible with descrambled video).

So we have the hidden plan scenario. It goes like this.

- 1) If high speed data requires far better receiver performance than video, and you plan somehow to be involved in a national, satellite delivered, high-speed data offering, then how would you create technical requirements for the receivers? Would you select the more forgiving video requirements or the more rigid high speed data requirements?

High speed data requirements is the correct answer.

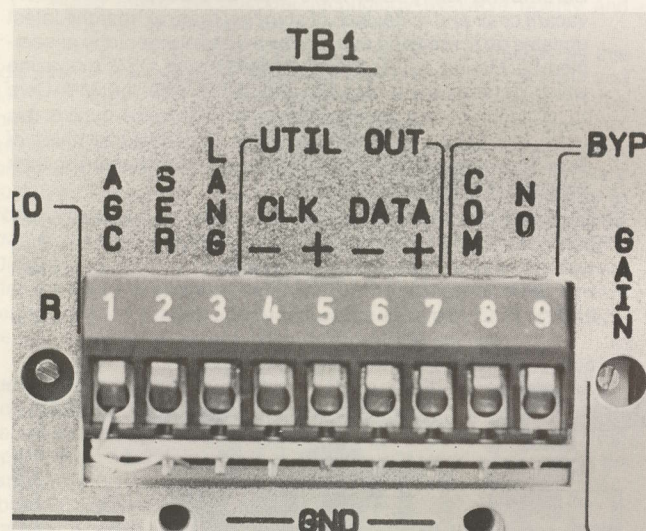
- 2) If you told everyone involved this is what you were up to, what do you suspect the reaction would be? Remember, you are PLANNING FOR a new service which might not be offered for years. But you are trying to sell receivers which will be used today.

Non-cooperation by other receiver suppliers is the correct answer.

- 3) If you also told everyone that the receivers required for **your** high speed **data service** were going to drive up the 'system' price, but that the requirements for your descrambled **TVRO service** would effectively keep the receiver complexity (and pricing) 'the same,' what do you suppose the receiver OEMs might say.

The answer is probably unprintable in a 'family publication.'

Is this what is behind the M/A-Com and HBO debacle to date? On a scale of 1 to 10, we'll assign a 6 to that one.



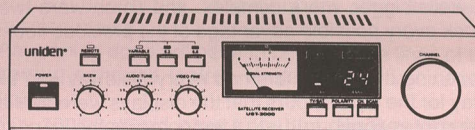
DATA OUTPUT (center; numbers 6 and 7) from VC2C are part of the future expansion plans for the Linkabit scrambling system. Is this a M/A-Com plan or is HBO parent Time, Inc. planning to participate in a high speed data home delivery service?

SUMMARY

CSD conducted tests to learn the extent of 'VC2C compatibility' from existing and 'stock' receivers in the field. Our test results do NOT agree with M/A-Com results 'leaked' to date. If we can walk into a TVRO service shop in South Florida with a VC2C under one arm and a stack of receivers under the other arm, and make 9 out of 10 receivers descramble with no real effort, it raises serious new questions about the culpability of M/A-Com and perhaps HBO in everything that has happened to date. How the industry, SPACE, and M/A-Com plus HBO address the questions raised, in the coming weeks, may well determine just where the entire scrambling situation heads for the balance of 1985.

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LAS VEGAS SHOW HIGHLIGHTS

WHAT'S BIGGER Than . . .

. . . a breadbasket and smaller than world trade fair? The 'SPACE/STTI Las Vegas Trade Show,' of course. But only slightly smaller than a world trade fair!

Numbers alone cannot properly create a foundation for the impact of the recently completed (March 31-April 2) event. SPACE Chairman **H. Taylor Howard**, speaking to approximately 1,000 gathered for the \$50-a-plate SPACE Banquet, reported 'more than 15,000 people, over 660 exhibit booths, more than 350 antennas' had appeared 'as if by magic' to welcome the 1985 TVRO industry into the 'legitimate world' of communications technology.

There was very little magic involved; hundreds, thousands of people worked for days prior to the opening on Sunday the 31st to insure that the opening would come off on schedule. A virtual army of workers, trucks, vans, fork-lifts and 'teamsters' pitched in to make the display portion of the gathering fall into place by the 10 AM opening bell. For many, the number of hours available to bring it all off were too few; booths were bigger, more complex, and some were two story affairs that took every possible advantage of the precious floor space available.

A huge opening day crowd jammed every aisleway and blocked every doorway for the 8 plus hours that the displays were available. A gigantic parking lot, reconfigured into a temporary home for nearly 400 antennas, contained approximately 100 additional 'booth spaces' pressed into service barely weeks ahead of the event as show organizer **Rick Schneringer** arranged for a circus tent to house additional firms desiring display space.

Yet in spite of the tremendous growth in displays and people, the event came off with very few real serious hitches. Exhibitors seemed delighted with the crowds, the 'buying mood' of the dealers and the high percentage of 'new dealers' on hand. Negative comments as the show wound down were primarily limited to the following areas:

- A) The industry should consider expanding its shows to a **four day** schedule; with the great number of booths now at trade shows, attendees need more than 3 days to adequately get around to visit all of the booths that interest them.
- B) An extra day, in front, should be created to allow **more time** for the set up of booths. As the booths have become more complex and now require additional time to set up and 'fine tune,' the 36 hour period allowed in Vegas may have been 'too short.'
- C) A full day, **after the close** of the show, should be allowed for booth tear-down. The reasoning follows the same lines as the extra time required for booth set-up.
- D) With a four day schedule, one day should be strictly for exhibit visiting; **no conflicting schedules** with any SPACE/STTI training sessions or meetings. (As the show's importance as a tool for SPACE and STTI to educate has grown, there have been fewer and fewer available hours for dealers to travel the exhibit hall floors.)

As you can see, these are not really negative feelings; quite the contrary, they represent a positive attitude about the importance of trade shows and the long-term impact that trade shows now have on

industry operations.

BEHIND The Scenes

The number one issue on and off the exhibit hall floor was **scrambling**. When will it begin (it did on March 29th; Cinemax western feed)? Will TVRO dealers be able to secure descramblers for their customers? How much will descrambled service cost? Who will be responsible for selling it? What receiver equipment will be available to descramble the service(s)???

There were few hard answers. Because, as prior to Las Vegas, those who would bring us a scrambled home service **still** do not have all of their plans formulated. There were, however, these developments in the scrambling arena:

- 1) On March 27th, just ahead of the show opening, **Congressman Gregg** (R-N.H.) introduced a new piece of legislation into the U.S. House of Representatives; **H.R. 1769** would create a two-year moratorium on all cable service satellite scrambling. In effect, no scrambling (including HBO) for a two-year period.
- 2) On March 28th, **Congressman Tauzin** (D-La.), **Rose** (D-N.C.), and **Whittaker** (R-Kan.) introduced a separate bill, **H.R. 1840**, which would force the cable satellite programmers, once scrambled, to deal evenly with all home TVRO viewers. More about this, shortly.
- 3) The National Cable Television Association (NCTA) immediately responded to the introduction of H.R. 1769 by going on the offensive against the satellite industry. In a release, NCTA stated "Congress . . . should reject the efforts of the satellite earth station dealers to obtain continued free programming for their customers while requiring millions of **cable** television customers to pay the freight."
- 4) On April 1st, the SPACE Dealer Board sponsored a '**Dealer Scrambling Rally**' and more than 800 people filled every vacant chair and every inch of standing room to hear the latest updates on scrambling and to view a special videotape assembled by Florida dealer **Frank Abruzzo** and CSD magazine which detailed tests recently completed with the M/A-Com VC2C family of descramblers (see separate report, page 8, this issue of CSD/2). In attendance were key representatives of both Showtime and HBO, although 'cleverly' **not wearing** their proper name badges.
- 5) Showtime/The Movie Channel, while contractually bound to purchase the M/A-Com Linkabit scrambling system for their own encryption, had key top level people in Las Vegas to meet with SPACE leaders on the question of how best to market a home TVRO service to our industry's customers. This was the



HOW IT WORKS/ Dr. Mark Medress (center, left in light suit) explains the operation of complete Videocipher scrambling and descrambler system in special showing for SPACE's Executive Committee during Las Vegas show.

first 'direct contact' between Showtime and our industry.

- 6) M/A-Com, in their Vegas booth, demonstrated a stripped down version of the full scrambling system with a demonstration tape which illustrated how individual home viewers would access the scrambled services, how they would pay for the services, and how the system's security would function. This was the first 'public display' of the full system, to the TVRO industry.
- 7) Just prior to the Las Vegas show, M/A-Com 'hosted' some thirty people who represented around 15 'key receiver suppliers.' The Linkabit plant in La Jolla, California was the setting and there the industry's top receiver engineering and marketing personnel were given a two-day 'cram course' on the Linkabit system as they learned for the first time how the system would be made available to them, and, for how much money.

All of this, and more, only served to further 'stir the pot.' Nobody left Las Vegas any surer that scrambling was here, or how it would arrive (if and) when it did finally appear. Oh yes, there was one more key ingredient in the scrambling pot.

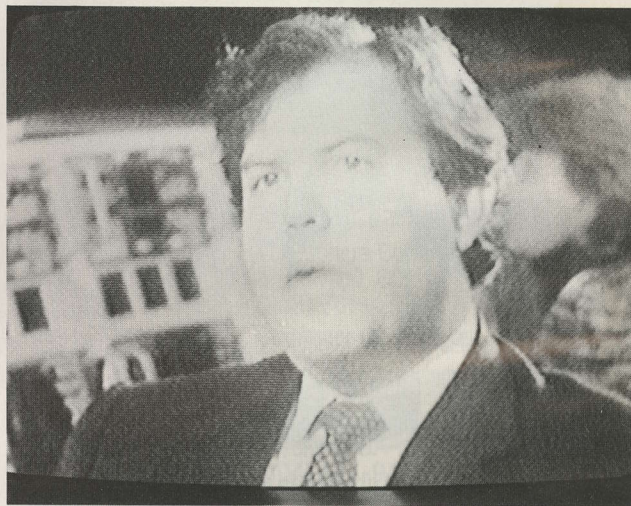
- 8) During the SPACE Board of Directors meeting on March 30th, industry supplier **Sandy 'Gus' Wirth** (Delta Satellite Corporation, Cedarsburg, Wi.) announced that he and five other individuals from the home TVRO industry had formed a corporation designed to provide home TVRO viewers with a premium movie service. Wirth's announcement was brief and lacked detail ("for business reasons") but it basically said that if the industry is unable to secure appropriate negotiated agreements with the present cable premium service suppliers, **there would continue to be a premium quality service available to home TVRO owners through this new entity.** Wirth explained that this 'industry created' premium marketing service would sell its programming exclusively **through TVRO dealers**, and would make the decoder technology available openly and evenly to **all industry receiver OEMs.**

Returning to H.R. 1840, one of the concerns addressed by this legislation is that under the presently announced plans of HBO and M/A-Com, **only HBO cable affiliates** will be selling 'agents' for the home TVRO service. The home TVRO industry, naturally, does not like having its software source limited to the local cable firms. Another concern of H.R. 1840 is that the source for the descrambling hardware must also be spread around; at the moment M/A-Com wants to produce **all** of the descramblers and sell them either as stand-alone adapter boxes (VC2000E) or as plug-in(to) receiver modules (VC-2000M). H.R. 1840 also addresses the pricing structure and would bring the FCC into the act of establishing 'fair pricing' for home viewers if either the programmer or the local cable affiliate became an impediment to a home owner obtaining descrambled service.

Tauzin, who headlined the SPACE banquet in Las Vegas, told his audience the industry cannot accept 'one manufacturer being the (sole) source for the decryption devices, thereby setting a de-facto standard.' Tauzin also roundly criticized recent statements by HBO representative **Ed Horowitz** that **'The sky will slowly, but surely, go dark'** (as more and more programmers scramble their services). Horowitz appeared on a major Canadian television broadcast in March and told the Canadian audience that 'all services will scramble, within sixty days,' and the telecast urged people **NOT to buy TVROs.**

If the industry did not resolve the complex scrambling issue while in Las Vegas, there was an upbeat report on zoning; the industry's 'number two' problem. For several years there has been a growing trend amongst towns and cities to adopt restrictive local zoning regulations regarding the use or placement of home TVRO antennas. Earlier this year **Senator Barry Goldwater** (R-Az) had introduced a resolution in the U.S. Senate asking the FCC to create a better foundation in 'law' for cities and towns to follow when adopting such zoning restrictions. Just days prior to Las Vegas, the FCC responded by going one better; they agreed, unanimously, to push for an 'expedited rule making process' which would establish detailed federal guidelines for cities, towns, counties and states considering restrictive regulations against home TVRO antennas.

The FCC proposes preempting local dish zoning regulations and placed their 'Notice of Proposed Rule Making' on the fast track;



"THE SKY WILL GRADUALLY TURN DARK". Ed Horowitz of HBO, appearing on Canadian TV program 'Marketplace', virtually shut-down the Canadian TVRO industry with one-line. A close inspection of the crowd at the SPACE Dealer Board 'Scrambling Rally' might have spotted Horowitz, sitting quietly in a dark corner with his identity badge removed. Keep up the good work Ed!

they have allowed a 30 'comment period' for the registration of opinions concerning the proposed rule making, and only 15 days after that cut-off date for 'reply comments' to be filed. The FCC hopes to have a 'final rule-making' on the issue out and in effect by July 31st.

The proposal from the FCC has three key points:

- A) There can be **no discrimination** against receive only (TVRO and ARO) terminals, 'in favor of any other (television) transmission media';
- B) Any zoning done will have to be along the lines of **traditional zoning concerns** (safety, health and welfare of residents in area);
- C) Any zoning would have to be the **'least restrictive way of achieving local objectives.'**

Goldwater aide **Terry Emerson** appeared in Las Vegas to explain how the FCC proposal would benefit the TVRO dealers and used as a key example of 'never again THAT way' a local ordinance in effect in Plantation, Florida. **This ordinance** requires that anyone wishing to install a TVRO antenna must first obtain the (written) permission of the local cable operator (!) before installing the terminal.

NEW Equipment Arena

The amount of new, never-seen-before, equipment in Las Vegas was staggering. Trends first.

Block equipment was everywhere; **R.L. Drake** introduced a new line-up of block hardware (models 324-B and 424-B where the B stands for block) supported by block downconverters, or LNB packages as well as necessary distribution hardware. Some of the equipment was immediately available; more is coming. Drake also announced several dealer incentive programs; free trips to Paris top the list. In a private showing to their distributors and the press, Drake was candid about threats to their leadership position and pledged to re-double their efforts to stay out in front.

Uniden's block hardware was also shown for the first time. The most significant thing about the new systems is that the new 5000 and 7000 series receivers are the first products designed by **Doctor Konishi**, a man with few peers in the microwave world. There will be limited delivery until mid-May and then apparently the dam will burst.

Gensat displayed the first 'master-master' BDC package we have seen; each receiver in the multiple receiver system can control the dish as well as have independent access to transponders within a satellite. Dealers installing this system will have to carefully under-



SPACE DEALER RALLY was created to answer dealer questions and concerns about the 'scrambling threat' and to allow dealers to recognize that they were not alone in this battle. The Dealer Board did an excellent job on this effort and as the Boresight TV report for April 4th showed, it was an exciting 90 minutes.

stand the technology involved and warn customers about the downside of 'dish-controller-wars.'

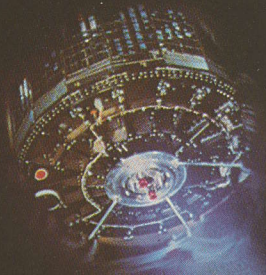
We have never been impressed with anything from **Janeil**. Their new receiver broke that mold and **we were impressed** with their BDC package. Apparently the designers have done some very clever original thinking including a built-in TI (terrestrial interference) filter which was amply proven in the heavy TI environment at the MGM Grand. Janeil's new system, subject of course to one-on-one review and careful analysis, may have been the sleeper product of the show; certainly it was the 'least expected.'

In the LNA/LNB/LNC department, any firm manufacturing only LNAs is possibly doomed to extinction. Block type (LNB) units were popping up all over the show at pricing which would have bought you only a (simple) LNA just 12 months ago. The new LNB packages are the new 'price leaders' in the continuing war to shove outdoor electronic pricing ever downward and with the shift away from straight LNA-only products, it appears that the downward spiral in stand-alone LNAs may be about bottomed out. If LNAs continue to drop from this point forward, it will probably be because somebody is caught with a warehouse filled with LNAs at a point in time where the marketplace has moved away from LNAs to the LNB configuration.

While nobody actually **counted** antennas and figured out percentages, the shift to mesh type designs seemed all but complete in Las Vegas. Fiberglass antennas numbered 'two' behind mesh designs, but well behind at that. Spun metal was a poor third and sectionalized metal brought up the basement. **ADM** demonstrated a new expanded metal format antenna with both 4 and 12 GHz performance and several suppliers (including **Chaparral**) displayed combination two-band systems (4 and 12 GHz, or, C plus Ku band).

(The failure of **USCI**, the day the Las Vegas show opened, said unfortunate things about the immediate future of 12 GHz. The five channel service has been skirting bankruptcy for several months and finally decided to call it quits. This leaves the NBC network feeds as the only real 12 GHz video service now functioning on a 'scheduled' basis and unfortunately many of the low-priced receivers being sold for the defunct USCI service cannot directly access the NBC audio feeds; dealers presented with the opportunity to buy a 'bargain-priced' 12 GHz package should be cautious about the **audio tuning capability** of the 12 GHz hardware.)

New test equipment, long a shortcoming within the industry, was semi-abundant. **AVCOM** displayed two new spectrum analyzers designed specifically for TVRO use and with their lead certainly others will follow. Representatives from several of the 'established' test equipment leader firms were on hand carefully studying both the industry and reaction to the AVCOM units. We were exceedingly



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impressed with the AVCOM **PSA-35** portable analyzer (just under \$2,000) because it had all of the measurement accuracy and field portability needed by a busy, professional installer. The larger **MSA-85** will be just as useful in a lab or in a production line environment (over \$5,000). We'll be seeing far more test equipment available before the year is out although the brisk business we witnessed in the AVCOM booth suggests that many would-be users will be waiting for a while to allow delivery to catch up with sales display.

Several dealers wanted us to look into the various 'packaged cables' now being sold. It seems that some of the so-called bargain priced cable sets (with one or two runs of RF/coaxial cable plus some number of control and voltage wires) have proven to be very unsatisfactory in the field. **Special problems are occurring** with the 950-1450 MHz block IF ranges when you select a cable which has **poor shielding**. Normal RG-59 and RG-6 was never designed to function above 1,000 MHz so virtually the entire block IF range is beyond or above the frequency limits of the cable's own integrity. Some may work fine there; **most will not**. If you are into even simplistic one-set systems with the 950/1450 MHz IF, be very careful to insist on seeing coaxial cable performance figures for any cable you are buying. **M/A-Com**, for example, **offers a cable** which has been **swept-tested** for the full 950-1450 region. Sweep testing is a standard procedure for CATV cables and it involves sending a broadband (sweep) test signal through the entire roll of cable to test what happens within the 1,000 (2,000, etc.) foot roll. A properly done sweep test of a roll of cable will reveal whether the cable has unusual 'suck outs' or other undesirable properties anywhere within the frequency band of interest (such as 950-1450). A top-notch supplier will sweep test **every roll** of cable he ships and mark the results down on a test card attached to the roll. Short of that, sweep-testing for the 'family' of cable is essential if you are going to use it for BDC systems. Yes, high integrity cable does cost more but it also is guaranteed to work. We'll be talking more about this 'new problem' in CSD shortly.

Control of the video quality seemed to be a new priority with receiver suppliers. The performance margin between an 'expensive'



HUGE AND IMPRESSIVE. High marks for custom booth design would go to Raydix who virtually built a 'room within a room' in Las Vegas.

receiver (one over \$600 dealer cost) and the less expensive receivers (any under \$300 dealer cost) narrowed noticeably. Low quality video (noise in the video, ragged edges on the dark to light [or light to dark] transition lines), and sync instability seemed no longer acceptable in low end equipment. In the past, a dealer paying \$200/\$250 for a receiver (any receiver) sort-of expected to have less-than-Washburn video. Alas, no more. If you are still finding less than acceptable video when you unpack a low-end receiver, either you have a lemon or you are buying the wrong low-end receiver.

In the actuator department, we were particularly impressed with the new 2001 and 2010 units from **Superwinch**. This firm jumped into the marketplace about three years back with a good product (for the time) which rapidly became number three in sales (behind MTI and Houston). Then after a bunch got into the field, water freeze up and gear trains and every other possible problem hit. So they did the intelligent thing by taking the product line off the market. The result of a year of redesigning and careful study was on display in Vegas. Their **'What You Need To Know About Actuators'** and their new exceedingly well done **'Superwinch Installation and User's Manual'** is available to any bonafide dealer for the asking (Superwinch, Inc., Winch Drive, Putnam, Ct. 06260). Recommended reading.

Our nomination for special recognition in the **'Standing-Behind-Dealers'** award department goes to **Luxor**. In our CSD/2 for March 15th, we reported on some preliminary testing we did with their new Japanese built downconverter. Our review was favorable. At Las Vegas, Luxor also announced that any dealer with a 'problem installation' that includes the older-style Magnum downconverter may arrange directly through Luxor for the **exchange** of their Magnum downconverter **for a new version downconverter**. To the best of our knowledge, this is the first time that an OEM has offered to exchange an improved version for an older version, in our field. **Congratulations to Luxor** for putting the customer (and the dealer) ahead of more selfish interests.

In the unusual product department, **California Amplifier** displayed a new system package which may prove to be a boon to BDC system designers. Here's the concept. You have a system with a dual pole feed; separate LNAs and downconverters or LNBs for say 400-900 or 950-1450 MHz. To this single antenna with separate (polarization) feeds you connect a pair of receivers. You would like to allow **either receiver** to view **all of the transponders on either polarization**, independently. We already know that in a true master and slave situation both receivers could independently watch any transponder on **one** polarization, but the polarization is controlled solely by the master receiver.

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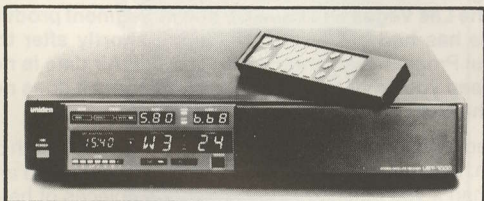
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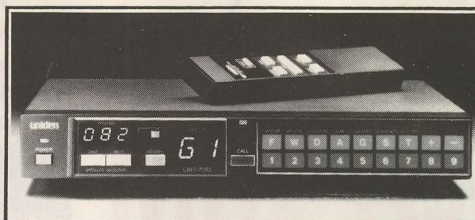
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20/20 TV. Field production crew for the well-viewed ABC Thursday night program was completing an intensive look at home TVRO during the Las Vegas STTI SPACE show. Segment producer Hugh Downs has had his own TVRO since shortly after the Young Astronaut Program was announced last fall. Air date is not yet set; we'll keep you advised, and cross our fingers it does not turn out like the CBC 'Marketplace' feature!

switch then selects which polarization goes to which receiver; both on one polarization, both on 'the other,' or split. Quite clever indeed and priced at less than if you batched together separate pieces of hardware to do the same thing 'the old fashioned way.' But they need a one-liner name for the device; perhaps 'Switcher-Roo'?

Finally there was the Canadian contingent. Canadian attendance was 'down' from previous years, largely the result of a very unfortunate television program airing early in March on the CBC network. In that program ('Marketplace') Canadians heard why they should NOT go out and buy a TVRO. Canadian distributors and dealers report that the day after the telecast, interest in new systems dropped from 10 to 90%! Worse than that, it has stayed down in most areas since the telecast. The Canadian television program did something which nothing else in Canada previously had been able to accomplish; it provided a national unity action and a 'flag' around which Canadian operators could rally.

During the STTI/SPACE show, Rick Schneringer provided a meeting room for the Canadian people to gather and for the first time in the history of Canadian TVRO, virtually all of those attending agreed that some concerted action must take place to get a **Canadian TVRO trade association** off the ground. After the group left the meeting they issued a press release to all Canadian press sources announcing their intentions. Canadians interested in following up on this activity should telephone **Russ Walsh** at 604/856-3381.



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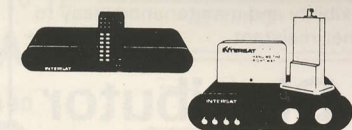
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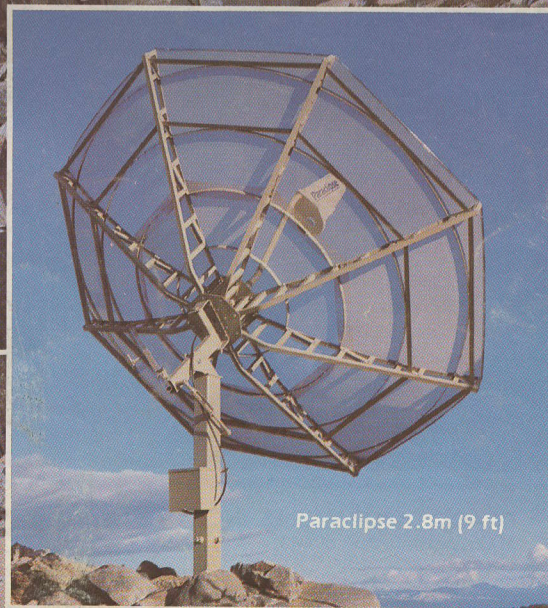
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